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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,951

06/21/2006

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EXAMINER

RICKMAN, HOLLY C

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

06/25/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/583,951	Applicant(s) MAEDA ET AL.	
	Examiner Holly Rickman	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 7-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 18 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/13/09;1/17/08;6/21/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Claims 9-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected method, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 4/16/09.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2 and 6-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is indefinite because it requires that the Ti oxide comprises TiO_2 but claim 1 from which it depends requires that the Ti oxide is TiO and/or Ti_2O_3 . Thus, it is not further limiting. The examiner suggests amending the claim to state "wherein Ti oxide further comprises TiO_2 ."

Claims 6-8 are indefinite because they lack antecedent basis for the "oxide in the undercoating layer." Claim 1 does not disclose an oxide in the undercoating layer.

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Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 3-6 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakawaki et al. (US 7470474).

Sakawaki et al. disclose a perpendicular magnetic recording medium having a substrate, at least one undercoating layer, and a granular magnetic layer having CoCrPt magnetic grains separated by oxide grain boundaries formed from TiO or TiO₂ wherein the oxide content is preferably 5-10 mol% (see col 9, lines 22-28 and 40-43; col. 10, lines 55-67; col. 17, lines 50-56).

With regard to claims 4-6, the reference teaches the use of an Ru-SiO₂ underlayer having Ru grains dispersed in a n oxide matrix (col. 8, lines 54-63). The amount of oxide in the underlayer is preferably 4-12 mol % (lines 64-66). The group of suitable underlayer materials is small enough that one of ordinary skill in the art would have immediately envisaged an embodiment using Ru-SiO₂.

With regard to claims 18-19, Sakawaki et al. teach a perpendicular recording apparatus using the above described magnetic recording medium in conjunction with a single pole magnetic head (see col. 6, lines 28-31).

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6. Claims 1, 3-4 and 18-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Wu et al. (US 7192664).

Wu et al. disclose a perpendicular magnetic recording medium having a substrate, at least one undercoating layer, and a granular magnetic layer having Co-alloy magnetic grains separated by oxide grain boundaries formed from TiO and TiO₂ wherein the oxide content is 6 mol% for example with a maximum amount of 15 mol% (see col 6, lines 55-60; col. 5, lines 38-57; col. 4, lines 64-67).

With regard to claim 3, Wu teaches the use of a CoPt alloy with the addition of an element such as Cr. The group of suitable additive elements is small enough that one of ordinary skill in the art would have immediately envisaged an embodiment using CoPtCr (see columns 7-8, claims 1-3).

With regard to claim 4, Wu discloses an intermediate layer corresponding to the claimed undercoating layer formed from Ru or Ru alloys (col. 6, lines 26-29). The group of suitable intermediate layer materials is small enough that one of ordinary skill in the art would have immediately envisaged an embodiment using a Ru-containing intermediate layer.

With regard to claims 18-19, the reference teaches use of the aforementioned recording medium in a recording apparatus using a single pole head (col.. 4, lines 64-67).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu et al. (US 7192664).

Wu et al. disclose a perpendicular magnetic recording medium having a substrate, at least one undercoating layer, and a granular magnetic layer having Co-alloy magnetic grains separated by oxide grain boundaries formed from TiO and TiO₂ wherein the oxide content is 6 mol% for example with a maximum amount of 15 mol% (see col 6, lines 55-60; col. 5, lines 38-57; col. 4, lines 64-67). The reference specifically states in col. 6, lines 55-60 that the disclosure of TiO₂ at the grain boundaries of the magnetic layer includes TiO. Thus, it is clear that Wu envisaged a grain boundary with some mixture of TiO and TiO₂ even though the specific proportions of the two compounds are not explicit.

It would have been well within the level of ordinary skill in the art at the time of invention to determine the optimal ratio of TiO₂, TiO and other non-stoichiometric Ti oxides to use in the grain boundary.

9. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakawaki et al. (US 7470474).

Sakawaki et al. disclose all of the features of the claims, as detailed above, except for the use of a Ru undercoating layer containing TiO or Ti₂O₃ or TiO₂ in an amount of less than or equal to 90 mol%.

Sakawaki teaches the equivalence of TiO and TiO₂ for use as a grain segregating material in the magnetic layer taught therein. The reference discloses the use of oxide grain

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segregating materials in the Ru-containing undercoating layer taught therein. The reference discloses TiO₂ as a specific example of this. It would have been obvious to one of ordinary skill in the art to substitute some amount of TiO for the TiO₂ grain boundary material in the Ru layer in view of the art recognized functional equivalence of TiO and TiO₂ for this purpose.

Optimization of the specific contents (mol percentages) of each component would have been well within the purview of one of ordinary skill in the art at the time of invention.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6699600 is cited as art of interest as being the English equivalent of JP 2002-358615.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Holly Rickman whose telephone number is (571) 272-1514. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Bernatz, Acting SPE for Carol Chaney can be reached on (571) 272-1505. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Holly Rickman/
Primary Examiner
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